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# THE PLANT DISEASE REPORTER

Issued By

## THE PLANT DISEASE SURVEY

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

AGRICULTURAL RESEARCH ADMINISTRATION

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY
DIVISION OF MYCOLOGY AND DISEASE SURVEY

Plant Industry Station Beltsville, Maryland
Volume 30 November 15, 1946 Number 11

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# A REPORT ON CERTAIN TOMATO LINES, SELECTIONS AND VARIETIES UNDER OBSERVATION AT THE MISSISSIPPI TRUCK CROPS BRANCH STATION DURING 1945 AND 1946[1]

H. H. Foster

Breeding and selecting tomatoes in the hope of developing a "perfect" variety is a major project in all Southern States where tomatoes are grown as a commercial crop. A major part of these breeding programs is devoted to locating and increasing resistance to the economically important tomato diseases. Some commercial companies are engaged in similar breeding programs.

During relatively recent years resistance to a number of important tomato diseases has been reported; the source of resistance, in most cases, has been from a species other than Lycopersicon esculentum Mill. Today one or more commercial varieties carries a high degree of resistance to Fusarium wilt. In addition to Fusarium wilt the following are some of the more important tomato diseases for which resistant lines have been reported: Collar Rot (Alternaria solani (Ell. & Mart.) Jones & Grout), Septoria (Septoria lycopersici Speg.) and Stemphylium (Stemphylium solani Weber) foliage blights, and Leaf Mold (Cladosporium fulvum Cooke). Recently, resistance to Late Blight (Phytophthora infestans (Mont.) DBy.) has been reported by Andrus and Wade (PDR 30 (6): 213-214, 1946). Previously, Richards and Barratt (PDR 30(1): 16-20, 1946) reported none of the 137 tomato species and selections tested to be highly resistant to or immune from Late Blight. Although definite advancements have been made in the development of disease resistant tomatoes, much remains to be accomplished. Before the tomato disease problem in Mississippi is solved genetical resistance to the following diseases must be located or markedly improved: Common Mosaic (virus), Buckeye fruit rot (Phytophthora parasitica Dast.), Late Blight (Phytophthora infestans), Early Blight (Alternaria solani), Southern Blight (Sclerotium rolfsii Sacc.), and certain bacterial fruit spots, Bacterial Spot (Xanthomonas vesicatoria (Doidge) Dowson (Bacterium vesicatorium Doidge)), and Bacterial Speck (Bacterium punctulans Bryan).

For three consecutive years the tomato disease problem has been of major importance in Mississippi's commercial "green wrapped" area. Certain diseases developing to epiphytotic proportions offered an excellent opportunity to make observations on tomato lines regarding resistance and susceptibility. With Fusarium wilt, artificial greenhouse inoculations were used in determining the degree of resistance. An earlier report (PDR 29(16): 396-400, 1945) gives results for the 1944 season. The present report deals with the reaction of certain tomato lines observed in greenhouse and field plot experiments

[1] Contribution from Mississippi Truck Crops Branch Experiment Station, Crystal Springs, Mississippi. Published with the approval of the Director, Mississippi Agricultural Experiment Station. Paper No. 127, New Series.

covering a 2-year period of 1945 and 1946. Certain tomato lines, developed in several important commercial areas, were under observation. Disease data are given in table 1, data pertaining to plant and fruit type are presented in table 2, and certain promising tomato lines, with remarks, are listed in table 3.

U.S. V.B.L. Lines. Tomato lines and selections received from the U.S. Vegetable Breeding Laboratory have included interesting and valuable breeding stock. A total of 58 lines and selections were greenhouse tested for resistance to Fusarium wilt, resulting in 30 lines highly resistant, 16 segregating, and 12 susceptible. In field plot tests 35 representative lines and selections were observed. In 1945 five lines appeared resistant to the Alternaria and Septoria foliage blights. In 1946, early in the spring season, certain lines appeared resistant to Early Blight. Some of the same lines that appeared resistant in 1945 again showed resistance in 1946. Following a Late Blight epiphytotic, all V.B.L. lines in this observation plot were almost completely defoliated and appeared highly susceptible. (Certain V.B.L. lines in the Southern Tomato Exchange Program did appear somewhat resistant to Late Blight). A number of V.B.L. lines possessed desirable plant and fruit characters. Certain of these lines look promising and with additional breeding and selection may continue to show a high degree of resistance to several important tomato diseases.

U.S.D.A. Beltsville Lines. Through the courtesy of Dr. W. S. Porte, U.S.D.A., 15 lines ($F_2$ and $F_3$ generation seed), developed from inter-specific crosses, were included in the 1946 field plot test. Segregation for disease resistance, plant and foliage type, and fruit size, shape, and color was striking. After passing through the Late Blight epiphytotic a few plants still retained most of their foliage, indicating greater resistance than other lines under observation. Following inoculation with common tomato mosaic, an occasional plant in several lines suggested marked tolerance and possible resistance. A great variety of foliage and fruit types were observed. Certain of these lines appeared especially promising in a breeding program for disease resistance.

Indiana Lines. Forty lines and selections in a Fusarium wilt test showed 32 lines as highly resistant and 8 segregating for resistance. In field plot observation tests 20 representative lines and selections were found to be susceptible to certain foliage blights.

Certain foliage and fruit characters of the Indiana lines appear undesirable from the standpoint of the "green wrapped" trade. Foliage is usually sparse and fruit are somewhat small and often flattened to rough in appearance. However, many of these lines are prolific in both spring and fall, and fruit have an excellent red

Table 1. Disease reaction of certain tomato varieties, lines and selections--1945 and 1946

| Seed Source | Reaction to Fusarium wilt (artificial inoculation, greenhouse test) 1945 and 1946 | | | | Reaction to foliage blights (natural infection) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1945 | | 1946 | |
| | | | | | | Alternaria and Septoria | | Alternaria and Phytophthora | |
| | Total tested | No. resistant | No. segregating | No. susceptible | Total in field plot | No. resistant | No. susceptible | No. resistant | No. susceptible |
| U.S. V.B.L. Station, Charleston, S.C. | 53 | 30 | 16 | 12 | *(a)35 | 5 | 16 | 0 | 17 |
| U.S. Beltsville Station Beltsville, Md. | - | - | - | - | 15 | - | - | 5 | 10 |
| Ind. Station Dept. Plant Path. | 40 | 32 | 8 | 0 | *20 | 0 | 15 | 0 | 9 |
| Ohio Station Dept. Plant Path. | 29 | 20 | 9 | 0 | *14 | 0 | 12 | 0 | 5 |
| Missouri Station Dept. Plant Path. | 46 | 34 | 9 | 3 | *27 | 0 | 17 | 0 | 16 |
| Nebr. Station Dept. Hort. | 13 | 0 | 2 | 11 | *18 | 0 | 14 | 0 | 7 |
| Miss. Truck Crops Branch Station | 8 | 6 | 0 | 2 | 14 | 0 | 7 | 0 | 7 |
| Named Varieties (commercial) | 14 | 1 | 0 | 13 | *14 | 0 | 13 | 0 | 9 |

* Some duplication of varieties, lines and selections tested in 1945 and 1946.

(a) This group does not include V.B.L. lines under observation in the Southern Tomato Exchange Program (STEP).

Table 2. Observations regarding foliage and fruit type of certain varieties, lines and selections --1945 and 1946

| Seed Source | Total observed | Plant type and foliage: Fair to good | Plant type and foliage: Poor | Fruit: Set: Fair to good | Fruit: Set: Poor | Fruit: Size: Medium to large | Fruit: Size: Small to medium | Fruit: Shape: Globe | Fruit: Shape: Oblate to rough |
|---|---|---|---|---|---|---|---|---|---|
| U.S. V.B.L. Station, Charleston, S. C. | 35 | 31 | 4 | 31 | 4 | 14 | 21 | 29 | 6 |
| U.S. Beltsville Station Beltsville, Md. | *15 | - | - | - | - | - | - | - | - |
| Indiana Station Dept. Plant Path. | 20 | 20 | 0 | 19 | 1 | 15 | 5 | 0 | 20 |
| Ohio Station Dept. Plant Path. | 14 | 12 | 2 | 12 | 2 | 12 | 0 | 12 | 2 |
| Missouri Station Dept. Plant Path. | 27 | 25 | 2 | 26 | 1 | 25 | 2 | 23 | 4 |
| Nebr. Station Dept. Hort. | 18 | 2 | 16 | 17 | 1 | 10 | 8 | 18 | 0 |
| Miss. Truck Crops Branch Station | 14 | 12 | 2 | 14 | 0 | 7 | 7 | 14 | 0 |
| Named Varieties (commercial) | 14 | 13 | 3 | 14 | 0 | 8 | 6 | 13 | 1 |

* Lines of $F_2$ and $F_3$ generation--extreme segregation--no line is uniform.

Table 3. List of certain promising tomato lines

| Seed Source | Mississippi Assigned Number | Remarks |
|---|---|---|
| U.S. V.B.L. Station, Charleston, S. C. | 5<br>8 | Certain selections from No. 5 and No. 8 have indicated marked tolerance or resistance to Early Blight; also resistance to Fusarium wilt. |
| U.S. Beltsville Station, Beltsville, Md. | *44B284<br>44B278<br>44B285<br>44B277<br>44B389 | $F_2$ plants--One or more plants from each of these lines appeared markedly tolerant or resistant to both Late Blight and Early Blight. |
| " | *44B389<br>44B288<br>44B286<br>44B282<br>44B280 | $F_2$ plants--One or more plants from each of these lines, following artificial field inoculation, appeared markedly tolerant to common mosaic. |
| Indiana Station Dept. Plant Path. | 14 | Certain selections from No. 14 were highly resistant to Fusarium wilt; also were prolific in both spring and fall and have excellent color. |
| Ohio Station Dept. Plant Path. | 76 | Certain selections from this line were highly resistant to Fusarium wilt, produced vigorous plants setting fruit well in both spring and fall. One selection yielded close to Rutgers in spring of 1946. |
| Missouri Station Dept. Plant Path. | 45<br>46<br>47-B<br>61 | Certain selections from these lines appeared highly resistant to Fusarium wilt. In certain lines fruit were large, deep, and globe-shaped. Fruit color varied from pink to red. |
| Nebraska Station Dept. Hort. | 87<br>89 | These lines were not resistant to Fusarium wilt or foliage blights. Certain selections were very prolific. |
| Miss. Truck Crops Branch Station | 29 | Certain slections from this line were resistant to Fusarium wilt, also prolific. |

*Line numbers remained the same as original--received from Dr. W. S. Porte.

color. Certain of these lines may have value in breeding for improved color and fruit set.

Ohio Lines. Twenty-nine lines and selections were tested for Fusarium wilt reaction, of which 25 lines were highly resistant while 9 lines showed some segregation. A total of 14 lines and selections were under observation in the field plots. Data taken in late June of 1945 and 1946 indicated all lines were susceptible to the foliage blights present.

Certain selections, all derived from a single line, appear promising. Young plants are vigorous, later produce good foliage in the field and set several fruit clusters in both spring and fall. The fruit are globe-shaped, though some may be slightly smaller and rougher than Rutgers. One of these selections yielded close to Rutgers in 1946 and appeared promising when compared with other lines in the Southern Tomato Exchange program. These selections are still segregating, but through additional selection and breeding a commercially desirable variety might be developed.

Missouri Lines. From 46 Missouri lines and selections tested, 34 were highly resistant, 9 segregating and 3 susceptible to Fusarium wilt. Twenty-seven lines and selections, under field observation, failed to show any resistance to the foliage blights present. Many of these lines appeared highly susceptible to Early Blight.

The Missouri lines are an interesting group; many are still segregating. Most of the lines have sufficient foliage early in the season, preceding foliage blight epiphytotics. In general the fruit are globe-shaped and medium in size, though some lines produce rough fruit. As a rule the fruit set appears less than for Rutgers. However, certain selections are producing rather large, deep, globe-shaped fruit. These selections may be useful in a breeding program.

Nebraska Lines. A total of 13 lines and selections were tested for Fusarium wilt rating. All lines were developed from at least moderately susceptible varieties. Consequently, no line rated as highly resistant. Two selections were segregating for resistance, possibly due to a natural field cross. Eleven selections were completely susceptible. Eighteen selections were observed in the field plot and during both years all selections were highly susceptible to the foliage blights present.

Nebraska lines and selections do not qualify for the "green wrapped" trade. However, they have certain qualities that might be useful in a breeding program. In general these lines produce better vegetative growth and set more fruit under fall conditions than in the spring. Certain lines are very prolific in fruit set; most lines mature fruit in advance of Rutgers. Some lines produce fruit

with a dark green color, others with uniform light green color, and still others are segregating for fruit color. Under Mississippi conditions these lines possess greater advantages for the home gardener than for the commercial "green wrapped" trade.

Mississippi Lines. A limited number of Station lines have been closely followed, in relation to disease resistance. Eight lines were tested for Fusarium wilt resistance, and of these 6 lines were highly resistant and 2 lines were completely susceptible. A total of 14 lines and selections observed in the field plot were highly susceptible to the foliage blights present. Twelve lines produced fair to good foliage and all produced a fair set of globe-shaped fruit.

Named Varieties. Fourteen named varieties, including Rutgers, were greenhouse tested for Fusarium wilt. Only one variety, Pan America, was highly resistant; 13 varieties were susceptible. None of the named varieties, including Pan America and Rutgers, showed marked resistance to the foliage blights.

Many of these varieties possess desirable plant and fruit characters such as abundant foliage preceding disease development, and relatively good set of medium to large globe-shaped fruit. Pan America has failed to yield as well as Rutgers during the spring season. The Rutgers variety, grown extensivly for the "green wrapped" trade, usually yields well in the spring commercial season, but in the fall frequently fails to set well and is late in ripening, on the Station experimental plots. Sioux and Red Cloud (released by the Nebraska Station) produce well in the fall. The Sioux variety produces relatively large and meaty fruit, and appears to be a good variety for the fall home gardener where Fusarium wilt is not a disease problem.

Breeding for Disease Resistance. A breeding program is under way, with the objective of obtaining field resistance to both Early and Late Blight. Resistance to common Mosaic and certain other diseases is hoped for. A single variety including resistance to the several major tomato diseases would be a long step forward. With the cooperation of Stations within tomato producing areas it seems quite possible that several Stations may develop disease resistant and commerically desirable varieties within a relatively few years.

MISSISSIPPI TRUCK CROPS BRANCH EXPERIMENT STATION
CRYSTAL SPRINGS, MISSISSIPPI

## THE BEHAVIOR OF DOWNY MILDEWS OF POTATOES TOMATOES, AND CUCURBITS IN MASSACHUSETTS IN 1946

O. C. Boyd

Owing to the unusually dry period extending from mid-June through a greater part of July, late blight [Phytophthora infestans] of potato started later in the season in most sections of the State and caused less damage to the crop than in most past seasons. However, after it did become established generally in the State around mid-August, the disease progressed very rapidly in unsprayed or poorly protected gardens and fields. The first report for the State, as far as I can learn, was by county agent Charles Harris in Bristol County who observed the disease during the first week of July in a field bordering on the coastal waters. Unsprayed potato plants in the Connecticut Valley went down from blight around the first of September.

Cucurbit downy mildew [Pseudoperonospora cubensis] was first observed in Bristol County on July 23-25, was widespread in that area by August 7-10, but was just becoming established at that time in Plymouth County. During August 12-15, it was noticeable in early stages throughout the Connecticut Valley pickle fields, and it reached the hill towns of Franklin County about one week later. Owing to the unusually cool, wet weather throughout August, the disease progressed rapidly, killing the plants within two to three weeks after it became established. Cantaloup fields were defoliated as a rule one to two weeks later than cucumber fields.

Squash and pumpkin vines withstood the attack of downy mildew much better than cucumbers and melons. Nevertheless severe damage may now be found to the leaves of pumpkins and Blue Hubbard and Butternut squash. On September 5, cucumber fields in Plymouth County that had been sprayed with Bordeaux mixture at weekly intervals since the third or fourth week of July showed only traces or very light infections.

Not since the outbreak in 1932-33 has late blight of tomatoes been so destructive to gardens and fields in Massachusetts. Instead of following late blight of potatoes as usual by three to four weeks, it developed throughout the State at the same time as potato blight. Even the earliest cases observed appeared to represent infections by the already "built-up" virulent strain of the fungus. It appeared over all the State at about the same time, and it is assumed that the fungus drifted through the air into this area from tomato fields in the heavily infested States to the south and west of New England --in the same manner as the cucurbit downy mildew fungus is believed to reach this area this year and in past seasons.

Growers along the coast in Plymouth County who have sprayed tomatoes at weekly intervals since the first week of August using homemade Bordeaux, have obtained almost perfect control of late blight. Those using Bordeaux powders or Yellow Cuprocide experienced varying degrees of control from poor to moderate.

Since field observations during the other epiphytotic (1932-33) in Massachusetts revealed the appearance of late blight on tomato plants growing on old vegetable dumps or cull piles, also on volunteer plants in fields, from one to two weeks earlier than it appeared in nearby tomato fields, some plant pathologists may be interested in examining tomato cull piles next summer for possible evidence to support the assumption that the fungus may be able to winter over in the seed or in other parts of the tomato fruit tissue (Phytopath. 25(1): 7, 1935).

MASSACHUSETTS STATE COLLEGE, AMHERST

## CONFERENCE ON SWEETPOTATO INTERNAL CORK; A PROBABLE VIRUS DISEASE

H. P. Barss

On September 12, 1946, about twenty-five agricultural scientists met at the Edisto Experiment Station, Blackville, South Carolina, to discuss informally the problem created for Southern sweetpotato-growing areas by the recently found internal cork disease[1]. All the information as yet available in regard to the disease was reviewed.

Dr. C. J. Nusbaum, who first discovered the disease in South Carolina sweetpotatoes in 1944 and has since done practically all the experimental work on it, briefly set forth the results of his research. The limited information available regarding the occurrence of the disease in other States was presented by representatives of those States.

Sweetpotato roots showing typical dark brown to black, hard, corky spots or irregular areas in the flesh were examined in the laboratory. Symptoms on growing vines were observed in the field plots. The light green spotting or blotching of the foliage, apparently associated with the disease, may be followed by the development of rings of reddish or purplish anthocyanin pigmentation around these spots and by final feathering out and disappearance of distinguishable symptoms.

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[1] Nusbaum, C. J. Plant Disease Reporter 29 (25/26): 677-678. Sept. 15/Oct. 15, 1945.

The main facts brought out included the following: Rather wide surveys in South Carolina had as yet disclosed no section that is free from foliage symptoms and no seedstocks of sweetpotatoes that can be considered free. The disease was known to extend through North Carolina from north to south. The disease is rather widespread in Georgia but apparently confined to limited spots with areas free from the disease in between. It had not been been found in Tennessee except at one limited location where all affected stocks were destroyed. The situation in Alabama, Florida, Louisiana, Arkansas and States farther west was unknown. The situation in Virginia was not known. No evidence of the disease in commercial fields in Maryland had been seen by the representative from that State. No evidence had appeared that the disease was present farther north.

The disease does not usually cause any necrosis of foliage and no evident reduction in yield but the dark, hard, corky areas found in the flesh of affected sweetpotatoes, although not affecting the flavor and consistency of surrounding tissue, are in themselves objectionable. No large percentage of disease has been found so far in the general run of commercial crops from affected fields.

The amount of internal corking differs greatly with different varieties. Porto Rico shows much, Nancy Hall apparently much less. Some varieties and strains apparently develop few or no root symptoms while the foliage of such lines may show pronounced symptoms. The internal cork spots are permanent and increase in number and area within the flesh of infected roots during the growing season and even more during storage.

The disease has not been transmitted by juice from infected plants through rubbing healthy foliage nor by using needle punctures. Transmission by core grafts has been successful in every instance leaving little doubt as to the virus nature of the pathogen. All attempts to isolate a fungus or bacterial pathogen have failed. The host range is unknown. No suspicious symptoms have been observed on the related wild morning glory, annual or perennial. The vector is as yet unknown but circumstantial evidence points to probable insect transmission.

The conference appointed a committee to draft an outline for a regional cooperative project on the disease with C. J. Nusbaum of the Edisto Station, South Carolina, chairman. The other members are J. H. Miller of the University of Georgia, and D. E. Ellis of North Carolina Experiment Station.

The project was recommended for consideration by the Southern experiment station directors as a possible regional project to be recommended for support under the new Agricultural Research and

Marketing Act when funds become available. It was planned to invite all interested States in the region to participate in the proposed regional attack on the disease.

The preparatory committee was authorized to call another conference of workers for further planning and review of progress, perhaps in connection with the meeting of the Association of Southern Agricultural Workers scheduled for Biloxi, Mississippi, January 15, 16, and 17, 1947. A mimeographed report of the Edisto Station conference was prepared for distribution.

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The Plant Disease Survey would like to request all observers to send in additional data on distribution, severity, varietal susceptibility, etc. from fields or storages in their respective areas of operation, including records of sweetpotato producing areas that are apparently free from internal cork and may provide sources of disease-free seedstock. P. R. M.

## PEACH YELLOW-RED VIROSIS IN ILLINOIS

H. H. Thornberry

Peach yellow-red virosis caused by Marmor lacerans, Holmes 1939 is spreading southward through Illinois on chokecherries (Prunus virginiana L.). During a survey conducted August 24 to 26 chokecherry bushes with typical symptoms of the disease were observed in Knox, Mercer, Peoria, and Rock Island Counties. The diseased bushes in Peoria County did not show marked rosetting and were probably infected within about a year. In the other counties some diseased bushes had developed rosetting with yellowish foliage, which indicated infections older than the current year. Since only about 1 to 3 percent of the chokecherries were diseased, it appears that the spread of the disease into these counties has been recent. Approximately 60 to 75 percent of the chokecherries are affected in the northeastern part of the State, where the disease was first observed on this host in Cook County in August 1939. The disease in these chokecherries was confirmed by inserting buds and bark tissues under the bark of greenhouse peach trees, which in due time developed unquestionable symptoms of the disease in peach.

A survey during the month of September 1939 over certain counties

in northern Illinois by inspectors of the Illinois State Department of Agriculture revealed diseased chokecherries in seven counties (Boone, Cook, DuPage, Kane, McHenry, Ogle and Winnebago)[1](3). In 1940 a further survey by these inspectors during the months of August and September disclosed diseased chokecherries in six additional counties (Carroll, JoDavies, Kendall, Lake, Stephenson, and Will)[2] (4, 5).

The consequence of the disease to peaches in Illinois is unpredictable at present. On chokecherries the disease has spread southward approximately 100 miles in the past six years. Since this host appears to be largely responsible for the spread of the disease under natural conditions (2), and also since the known distribution of chokecherries in Illinois does not overlap the areas of commercial peach orchards, there is some assurance that the disease may not invade the commercial peach areas. However, the four herbaceous hosts (tomato, carrot, parsley, and periwinkle) reported by Kunkel (1), and the possibility that other hosts exist that may bridge this gap in distribution between chokecherries and commercial peaches in Illinois, cause some uncertainty as to the safety of commercial peaches in Illinois. Since the additional diseased chokecherries found in 1946 were within areas containing a mixed population of many species of trees, shrubs, and wild vegetation, other wild hosts do appear to be likely. However, the dense wild vegetation in these areas may have favored abundance of the natural vectors, very probably insects, of the disease. No attempt was made to determine the species of insects in the vicinity of the diseased chokecherries.

References.

1. Kunkel, L. O. Transmission of virus from X-diseased peach trees to herbaceous plants. Phytopathology 34: 1006. 1944.
2. Stoddard, E. M. The "X-disease" of peach. Conn. Agr. Exp. Station Circular 122. 1938.
3. Thornberry, H. H. Virus diseases of the peach. Trans. Ill. State Hort. Soc. 73: 245-252. 1939.
4. _____. Virus diseases of the peach. Trans. Ill. State Hort. Soc. 74: 191-204. 1940.
5. _____. Peach yellow-red virosis or peach x-disease. Illinois Horticulture. Vol. 34, April 1945.

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1 Letter dated December 27, 1939 from H. F. Seifert, Chief Plant Inspector, Illinois State Department of Agriculture.
2 Letter dated December 10, 1940 from H. F. Seifert, Chief Plant Inspector, Illinois State Department of Agriculture.

# OBSERVATIONS ON COLEOSPORIUM CROWELLII

James L. Mielke

Since its discovery in 1916[1] the needle-inhabiting microcyclic rust, Coleosporium crowellii Cummins, has remained mainly a herbarium curiosity. Collections of the fungus have been infrequent, and generally it has been found in a locality on only a tree or two. Among the few reports in the literature[1,2,3] there are none of widespread occurrence or heavy infection of this rust. Nothing has been published regarding its pathology.

Following publication of the previous reports on Coleosporium crowellii it was observed to be fairly common on one area in the Black Range on the Gila National Forest, New Mexico in 1940 by E. L. Little, Jr. of the U. S. Forest Service, and in Mesa Verde National Park, Colorado in 1942 by S. T. Carlson of the Park Service. The host in both cases was Pinus edulis Engelm. In late September 1945 an extensive infection on Pinus edulis was noted in Grand Canyon National Park, Arizona, on the south side of the canyon. Diseased trees occurred over an area of several square miles. The intensity of the attack on the infected pinyons ranged from light to very heavy, while a portion of the trees in the stand bore no evidence of the rust. This infection pattern suggested the possibility of a variation in degree of susceptibility of the individuals. The telial horns produced by the fungus are reddish-orange color and these gave to the heavily attacked pinyons an appearance which at first glance suggested the possibility that they were dying. On closer inspection it was found that all but the current season's needles were infected. The diseased needles were still green. In June 1946 the area was again visited and it was found that the infected needles were dead and were being cast. Although the trees most heavily attacked had a very ragged appearance there was no indication that any of them would succumb. Apparently Coleosporium crowellii has not previously been observed over such an extensive area. Heavy rains occurred in the Park in August 1945 and these may account for the abundance of the parasite in this case.

The observations reported herein do not involve an extension of the previously known range of Coleosporium crowellii. It has been reported

[1] Hedgcock, G. G. Notes on the occurrence of Coleosporium crowellii Cummins in the United States. Plant Disease Reporter 23: 133-134. 1939.
[2] Cummins, G. B. A new microcyclic Coleosporium on limber and pinon pines. Phytopathology 28: 522-523. 1938.
[3] Dearness, John. Notes on Coleosporium crowellii. Plant Disease Reporter 23: 134. 1939.

on Pinus flexilis James from New Mexico,[2] and Pinus edulis from Colorado, New Mexico, and Arizona[1]. The main host of the fungus appears to be Pinus edulis for it is known from only one locality on the former.

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# THE EELGRASS SITUATION IN THE ANNISQUAM (MASSACHUSETTS) AND MYSTIC (CONNECTICUT) TIDE WATER RIVERS IN THE SUMMER OF 1946

Ralph W. Dexter

Certain areas in the Annisquam River at Gloucester, Massachusetts, and in the Mystic River at Mystic, Connecticut, which were examined for the return of eelgrass (Zostera marina) in 1945, were restudied in August of 1946. A report of the situation during the summer of 1945 was published in The Plant Disease Reporter 29(27): 702-704, 1945. In the summer of 1946 a considerable and significant increase in the abundance and spread of eelgrass was noted. While the eelgrass disease is still prevalent, the plant is definitely regaining a foothold. In the areas studied it has more than doubled its growth in one year.

## I. Annisquam River--Cape Ann, Massachusetts

This tidal inlet was examined on August 18 from Thurston's Point to Annisquam Harbor. As in previous years, Goose Cove had the best growth of eelgrass. By 1946, it had spread to such an extent that the upper half of the cove contained a solid stand of the plant, occupying an area of some twenty acres. The lower half of the cove had a rim of eelgrass from ten to twenty feet wide around the shoreline. The channel connecting Goose Cove with the main waterway contained many patches of eelgrass, some up to thirty square yards in area. In general, the patches were twice the size of those noted there last year. The shoreline of this cove was strewn with a continuous heap of eelgrass wrack. In Lobster Cove, five patches of eelgrass were observed. One occupied one square yard while the other four were less than one square foot in area. All of the beds and patches showed evidence of disease, but in general the plants were healthier, greener, and brighter in appearance than any seen since the epidemic of 1932. Many individual plants showed no evidence of disease. No eelgrass was found in Mill River or in the main channel of the Annisquam inlet. Floating fragments, most of them showing signs of disease, were, however, often seen on the water.

## II. Mystic River--Mystic, Connecticut

Examinations were made along the Mystic River from its junction with Fishers Island Sound to the Mystic Ship Yards, and also in neighboring West Cove, on August 8 and 9. Again, the greatest stand of eelgrass was in Beebe Cove (or Noank North Cove). A bed of approximately twelve acres extended from the cove entrance to a small island in the middle of the cove. In 1945, there was a solid stand of ditch grass or widgeongrass (Ruppia maritima) between the eelgrass

bed and the island. By 1946, the widgeongrass had been almost entirely replaced by eelgrass. Only small patches and isolated plants of widgeongrass remained. Even the larger patches of this species, now reduced to less than a few square yards, had blades of eelgrass scattered throughout. In some parts of the cove the widgeongrass has disappeared or thinned out without being replaced by any other form of vegetation. Apparently competition with eelgrass is not the only factor involved in the change observed at this location. On the landward side of the island and along the channel-way paralleling the railroad fill, eelgrass was found in small patches only. Along the main course of the river, on the west side, frequent patches from one to four square yards and occasional patches ten to twenty-five square yards were seen. Most of these were located in small coves or indentations of the shoreline, but around the end of Lighthouse Point, the rocky shore exposed to the open ocean was bordered with extensive strips, some ten to forty square yards in area. Along the eastern shores of the Mystic River (western margins of Mystic and Mason Islands) eelgrass was rarely found. Here the bottom materials are rocky and gravelly. In a large cove with a muddy bottom which cuts into Mason Island, however, frequent patches up to several square yards were observed.

In West Cove, immediately westward of the mouth of Mystic River, there was found an extensive bed of eelgrass which covered much of the bottom of the deeper end of the cove. Elsewhere patches were common. Probably one-half of the cove is now over-grown. According to Mr. Fred Ward, who lives on the cove and maintains a boat there, the eelgrass has increased 100 percent over 1945.

As in all other cases observed, the beds showed evidence of disease and many blades were broken off abruptly, although in general the condition of the plants seemed to be improved over that of the preceding year. Some plants were entirely free from brown streaks. Abundant fragments of eelgrass were found floating everywhere, and windrows of wrack were accumulating along sections of the shoreline. Probably the plant is extending itself through growth from old rootstocks, which to date has been most successful in coves and protected inlets. Its reestablishment along main channel-ways is just beginning.

KENT STATE UNIVERSITY, BINGHAM OCEANOGRAPHIC LABORATORY AND CONNECTICUT STATE BOARD OF FISHERIES AND GAME

## BRIEF NOTES ON PLANT DISEASES

### MICROASCUS TRIGONOSPORUS FROM SOYBEAN

By William W. Diehl

In August 1946 there was received for identification from Mr. M. D. Whitehead of the Oklahoma Agricultural Experiment Station at Stillwater a pure culture of a fungus that appears not to have been reported previously from continental United States. The fungus, Microascus trigonosporus Emmons & Dodge, has been known previously only from one account, the original description (Mycologia 23: 363, 331, ill. 1931), which was based upon a culture isolated in Puerto Rico from a lesion in human skin, although it was not determined to be a pathogen. The culture from Oklahoma sent by Mr. Whitehead was isolated from yellow soybean seed that came from Alabama, presumably grown there. Specimens have been deposited in the Mycological Collections and a culture has been transmitted to the American Type Culture Collection.--Division of Mycology and Disease Survey

### REPORT OF DEMONSTRATIONS USING DISEASE-FREE WESTERN-GROWN SNAPBEAN SEED

By S. B. Fenne

Fifty demonstrations in five counties were set up using seed of the Giant Stringless Green Pod, Bountiful, Black Valentine, and Tendergreen varieties of beans. The Southern States Cooperative obtained sufficient seed beans from Yuba County, California, to supply each cooperator for a limited garden test. A few demonstrations were on a large enough scale to be termed semi-commercial. As a rule the seed was planted adjacent to beans from home-grown seed and/or from commercial sources. In a few demonstrations, plantings were isolated from other beans.

Visits by the Extension Plant Pathologist and County Agents during the growing season gave a good cross-section of opinion from cooperators.

In general, it might be stated that Western-grown seed produced larger yields and the plants were more free of disease then those from home-grown sources. However, the commercial seed, purchased from reliable seed dealers and which was probably Western-grown,

produced about as well as the Western-grown seed used in this demonstration. In several cases where anthracnose and bacterial spot were observed in beans from Western-grown seed, the infection was found to have originated in the planting from home-grown seed nearby. When beans from Western-grown seed were isolated from other beans, they remained entirely free of anthracnose, but some mosaic was observed.

The conclusions that might be drawn from these demonstrations are: (1) Only Western-grown seed should be planted in Virginia. (2) There is great danger of anthracnose and bacterial spot if home-grown seed is planted. (3) The quality of most of the commercial bean seed sold in Virginia last season by reliable dealers was good and probably was grown in the West.--Virginia Extension Service.

## UNUSUAL PREVALENCE OF CORN RUST IN SOUTH CAROLINA

By C. H. Arndt and M. B. Stevenson

Statements made by farmers indicate that "firing" of the leaves of the corn plant was general throughout South Carolina in 1946. Fodder yields are said to be low. These reports reached the writers too late to make a survey to ascertain accurately the fungi associated with the firing. The observations that have been made indicate that corn rust [Puccinia sorghi] was unusually prevalent. Fields were seen in which not less than 50 percent of the leaf tissue appeared to be parasitized by the fungus; and sori were abundant on leaves, leaf sheaths, and ears. This report may be noteworthy, as this is the first season in which corn rust has been prevalent since 1940 or earlier.

Leaf spots caused by the two Helminthosporium species [turcicum, maydis] were also observed; but infection by these two fungi was not sufficiently prevalent to indicate that they were the cause of the firing--Clemson Agricultural College, Clemson, South Carolina. September 19.

## MINT DISEASES IN INDIANA AND MICHIGAN

By E. C. Stevenson

Verticillium wilt has been a serious threat to the mint industry in Michigan for several years. All commercially-grown peppermint seems to be susceptible. Spearmint is more resistant but losses occur in bad wilt years. Although the price of oil has remained at a fair level in recent years, plantings of mint in certain sections of Michigan have been decreasing steadily, owing to the spread of wilt. Until this season, Indiana plantings have escaped wilt for the most part. This year, however, in both Michigan and Indiana, mint has been severely attacked by wilt and losses to some growers have been considerable. Many fields had to be cut before they were prime in order to save a part of the crop. Early cutting reduces the yield and usually lowers the quality of the oil.

Anthracnose (originally called leopard spot) due to Sphaceloma menthae Jenkins, caused considerable trouble in peppermint fields in Indiana for several years but the disease has been largely brought under control by obtaining thorough coverage when the mint is plowed under in the fall. Anthracnose is reported by some growers around Berne, Indiana to have caused the culture of mint to be discontinued in that vicinity.

Mint rust, caused by Puccinia menthae Pers., occured to some extent both in Indiana and Michigan this year but it was not considered particularly serious.--Division of Tobacco, Medicinal and Special Crops, U. S. Bureau of Plant Industry, Soils, and Agricultural Engineering, Beltsville, Maryland.

## OCCURRENCE OF TOMATO SPOTTED WILT IN MISSISSIPPI

By John T. Presley

Spotted wilt [virus] has been observed at two locations in Mississippi. It occurred in home gardens at Aberdeen and near Vicksburg and the damage was very severe in both instances.--Mississippi Agricultural Experiment Station, State College, Mississippi, October 7.

## CHECK LIST REVISION

Freeman Weiss

### HESPERIS (CRUCIFERAE)

HESPERIS MATRONALIS L., DAMES-ROCKET. Perennial or biennial herb of Europe, cult. for ornament and naturalized in the Eastern and Central States.

Albugo candida (Pers. ex Chev.) O. Kuntze, white blister. N.Y.
Peronospora parasitica Pers. ex Fr. (? P. hesperidis Gäum.) downy mildew. N.Y., Pa.
Plasmopara brassicae Wor., club root. N.J.

Mosaic -- virus (probably Marmor brassicae Holmes, Brassica virus 2 K.M.Sm.) Oreg.

### IBERIS (CRUCIFERAE)

IBERIS spp., CANDYTUFT. Annuals, as I. AMARA L. (1) and I. UMBELLATA L. (2), or perennials of southern Europe, cult. for ornament.

Albugo candida (Pers. ex Chev.) O. Kuntze, white blister. Calif. (1)
Botrytis cinerea Pers. ex Fr., gray-mold blight. Alaska (2)
Cuscuta indecora Choisy, dodder. Tex. (1,2)
Erysiphe polygoni DC., powdery mildew. Calif. (1)
Heterodera marioni (Cornu) Goodey, root knot. Ala. (2)
Peronospora parasitica Pers. ex Fr. (P. iberidis Gäum.) downy mildew. Calif. (1)
Plasmodiophora brassicae Wor., club root. Mass., N.J. (2)
Rhizoctonia solani Kuehn, damping off. Cosmopolitan.

### LEPIDIUM (CRUCIFERAE)

LEPIDIUM SATIVUM L., PEPPER-GRASS, GARDEN CRESS (1). European annual grown in gardens for greens and sometimes escaped. L. CAMPESTRE (L.) R.Br. (2), biennial of Europe, widely naturalized in the U.S., a troublesome weed in the West. L. DENSIFLORUM Schrad. (3) and L. VIRGINICUM L. (4), widely distributed native annuals, (3) more frequent north and west, (4) south and east; of food value to wildlife.

Albugo candida (Pers. ex Chev.) O. Kuntze, white blister. Nebr. Tex. (1); Ind., N.Y. (2); general (3,4)

Lepidium cont.

Alternaria brassicae (Berk.) Sacc., leaf spot. N.Y. (2,4)

Cercospora sp., leaf spot. N.J. (2,4); P.R. (3). C. lepidii Pk. as reported on (2) and (4) in N.Y. has been shown to be Alternaria brassicae (Berk.) Sacc.

Cuscuta arvensis Beyrich, dodder. Okla. (4)

Cylindrosporium capsellae Ell. & Ev., leaf spot. Ind., Wis. (4)

Ditylenchus dipsaci (Kuehn) Filip., stem and leaf nematode. N.Y. (4)

Leptosphaeria virginica (Cke. & Ell.) Sacc., on stems. Ga., N.Y. (4)

Peronospora lepidii (McAlp.) G.W.Wils., downy mildew. S.Dak., Tex. (1); Kans. (3); Fla., Ill., N.Car., Va.(4). The form on (4) has also been designated P. lepidii-virginici Gäum., that on (1) P. lepidii-sativae Gäum.

P. parasitica Pers. ex Fr., downy mildew. Iowa, Kans., N.Dak., Tex., Wis. (3); general (4). See note above.

Phoma terrestris Hansen, secondary root rot. N.&S. Dak.

Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1,2,3,4)

Plasmodiophora brassicae Wor., club root. N.J. (2,4)

Pleospora lepidiicola Earle, on stems. Colo., Tex. (3)

Puccinia aristidae Tracy (O,I), rust. Tex. (1,4); Colo., Ky., Mont., Nebr., N.Dak., Tex., Utah (3); Ariz., Del., Ind., Kans., Nev., N.Mex. (spp.). II and III on Distichlis spicata and other grasses.

?P. holboellii (Hornem.) Rostr. (O,III), rust. Mont., Wyo.

?P. monoica (Pk.) Arth. (O,I), rust. Wyo.

Pythium debaryanum Hesse, damping off. Tex. (1)

Rhizoctonia solani Kuehn, damping off. Tex. (1)

Sclerotinia sclerotiorum (Lib.) DBy., crown rot. Mass. (1)

Septoria lepidiicola Ell. & G.Martin, leaf spot. Nebr., Tex., Wis. (3); Md., Ill., Miss., N.Y., Pa., Tex., Wis. (4)

Synchytrium lepidii M.T.Cook (? S.infestans Rytz), leaf gall. La. (4)

Mosaic -- virus. Not reported in nature but both Marmor brassicae Holmes and M. cruciferarum Holmes (Brassica viruses 2 and 3 K.M.Sm) can induce systemic mottle in (1) and (4)

LESQUERELLA (CRUCIFERAE)

LESQUERELLA spp., BLADDERPOD. Annual or perennial herbs of prairies and dry plains in the Middle and Far West, sometimes grown in wild gardens, some spp. of minor forage value.

Helminthosporium nanum Nees, leaf spot. Tex.

Phoma punctiformis Desm., stem blight. Tex.

Lesquerella cont.
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex.
Puccinia aristidae Tracy (C,I), rust. Ariz.

LOBULARIA (KONIGA) (CRUCIFERAE)

LOBULARIA MARITIMA (L.) Desv., SWEET ALYSSUM. Low perennial of southern Europe, cult. for ornament, occasionally naturalized in the Northeastern and Pacific Coast States.

Cuscuta sp., dodder. Tex.
Erysiphe polygoni DC., powdery mildew. Calif.
Heterodera marioni (Cornu) Goodey, root knot.
Peronospora parasitica Pers. ex Fr., downy mildew. Calif., N.J.
Plasmodiophora brassicae Wor., club root. N.J.
Pythium ultimum Trow, damping off. N.J.
Rhizoctonia solani Kuehn, damping off, root rot. N.J., N.Y., Va.
Sclerotinia sclerotiorum (Lib.) DBy., crown rot. Va.

Yellows -- virus (Chlorogenus callistephi Holmes, Callistephus virus 1 K.M.Sm.). N.J.

LUNARIA (CRUCIFERAE)

LUNARIA ANNUA L., HONESTY. European annual or biennial, cult. for ornamental flowers and seed pods; occasionally escaped.

Alternaria sp. (? A. oleracea Milbrath), black spot of leaves and pods. Mass.
Helminthosporium lunariae Pollacci, leaf spot. Mass.
Leptothyrium lunariae G.Kunze, on stems. Mass.
Plasmodiophora brassicae Wor., club root. N.J.

MATTHIOLA (CRUCIFERAE)

MATTHIOLA BICORNIS (Sibth. & Sm.) DC., EVENING SCENTED STOCK (1). Annual of southern Europe, grown for ornament. M. INCANA (L.) R.Br, including var. ANNUA (L.) Voss, COMMON STOCK (2). Perennial (also an annual form) of southern Europe, extensively cult. for ornament in the open and under grass, naturalized in Calif.

Botrytis cinerea Pers. ex Fr., gray-mold blight. Tex., Alaska. (2)
Colletotrichum gloeosporioides Penz. Tex.

Matthiola cont.

Fusarium sp. (? F. avenaceum Sacc.), root and stem rot. Del., N.J. (2)
F. oxysporum Schlecht., wilt. Ariz. (2)
Heterodera marioni (Cornu) Goodey, root knot. Tex. (2)
Myrothecium roridum Tode ex Sacc., leaf spot. Tex. (2)
Peronospora parasitica Pers. ex Fr. (P. matthiolae Gäum.), downy mildew. Ill. (2)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (2)
Phytophthora megasperma Drechs., root rot. Calif. (1,2)
Plasmodiophora brassicae Wor., club root. N.J. (1)
Pythium spp., damping off, root rot. P. artotrogus (Mont.) DBy. is reported in N.H., P. oedochilum Drechs. in ? Calif.; P. vexans DBy. in Calif.; all on (2)
Rhizoctonia solani Kuehn, damping off, root rot. Cosmopolitan (1,2)
Sclerotinia sclerotiorum (Lib.) DBy., crown rot, wilt. Calif., Mich., Pa. (2)
Verticillium sp. (? V. albo-atrum Reinke & Berth.), wilt. N.Y.
Xanthomonas incanae (Kendr. & Baker) Starr et al., black rot. Calif., Tenn. (2)

Curly top -- virus (Chlorogenus eutetticola Holmes. Beta virus 1 K.M.Sm.) Calif. (2)
Mosaic -- virus (Marmor matthiolae Holmes, Matthiola virus 1 K.M.Sm.) Calif. (2). Perhaps a strain of Marmor brassicae Holmes or M. cruciferarum Holmes (Brassica viruses 2 and 3 K.M.Sm.) Both viruses induce systemic mottling in this host but only the former causes flower-breaking.
Spotted wilt -- virus (Lethum australiense Holmes, Lycopersicon virus 3 K.M.Sm.) Tex. (2)

NASTURTIUM (CRUCIFERAE)

NASTURTIUM OFFICINALE R.Br. (Rorippa nasturtium-aquaticum (L.) Schinz & Thell.), WATER CRESS. Aquatic perennial of Eurasia, naturalized in streams throughout the Eastern and Central States to California; cult. for greens and furnishes food for wildlife.

Albugo candida (Pers. ex Chev.) O.Kuntze, white blister. Minn.
Cercospora nasturtii Pass., leaf spot. Calif., Conn., Fla., Ind., N.H., Tex., Wis., Hawaii
Puccinia aristidae Tracy (C,I), rust. Ariz., Colo.

RAPHANUS (CRUCIFERAE)

RAPHANUS SATIVUS L., GARDEN RADISH (1) and R. RAPHANISTRUM L., WILD R. European biennial, (1) cult. and sometimes escaped, (2) naturalized in the Northeastern and Pacific Coast States, sometimes a weed but furnishes food for wildlife.

Actinomyces scabies (Thaxt.) Güssow, scab. Ind., Mich., N.J., Ohio, Tex., Wis. (1)

Albugo candida (Pers. ex Chev.) O.Kuntze, white blister (white rust). General (1); no reports on (2) in U.S. but doubtless present.

Alternaria brassicae (Berk.) Sacc. (A. herculea (Ell. & G. Martin) Elliott), gray leaf spot. Calif., Conn., Mich. (1)

A. oleracea Milbrath (? A. circinans (Berk. & Curt.) Bolle), black leaf spot. Conn., N.J. (1)

A. raphani Groves & Skolko, black pod blotch. Calif., Mich., Minn., N.J., Ohio, Pa. (1). A. tenuis Nees ex Wiltshire also occurs commonly as a saprophyte on seeds.

Aphanomyces raphani Kendr., black root (in part). Me. to Fla., Okla., and Iowa; Calif. (1). See also Pythium aphanidermatum.

Ascochyta sp., root rot. Mass. (1)

Cercospora atrogrisea Ell. & Ev., leaf spot. N.J. (1)

C. cruciferarum Ell. & Ev., leaf spot. Ala., Ill., Mo., Tex. (1)

Cercosporella albomaculans (Ell. & Ev.) Sacc., white spot. Fla. (1)

Ditylenchus dipsaci (Kuehn) Filip., stem and leaf nematode. N.Y. (2)

Erwinia carotovora (L.R.Jones) Holland, soft rot. Cosmopolitan.

Erysiphe polygoni DC., powdery mildew. Calif., Mo., Tex. (1)

Heterodera marioni (Cornu) Goodey, root knot. Ala., Miss., Oreg., Pa., Tex. (1)

Peronospora parasitica Pers. ex Fr. (P. brassicae Gäum.), downy mildew. Northeastern and Central States to Miss. and Tex.; Calif. (1); N.J. (2)

Phoma sp. (? P. lingam) Tode ex Fr.) Desm.), pod rot. Fla. (1)

Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1)

Plasmodiophora brassicae Wor., club root. Occasional in the North, Mass. to N.J. and Minn.; also Wash., Alaska (1)

Puccinia aristidae Tracy (O,I), rust. Ariz., Colo. (1)

Pythium aphanidermatum (Edson) Fitz., black root (in part). Ind., Kans., Mass., Mich., Miss., N.Y., Ohio, Okla., Pa., S.Car., Wis. (Mass. to S.Car., Okla., and Wis. (1)). See also Aphanomyces raphani.

P. debaryanum Hesse (perhaps P. ultimum Trow), damping off. Mass., Minn., N.J., Va. (1)

Rhizoctonia solani Kuehn, damping off, root rot. Cosmopolitan.

Sclerotinia sclerotiorum (Lib.) DBy., crown rot, watery soft rot.

Raphanus cont.
Calif. (1,2); Ind., Minn., N.J., Tex. (1)
Stemphylium botryosum Wallr., on seed. Cosmopolitan.
Xanthomonas campestris (Pam.) Dowson, black rot. Ind., Iowa, Mich., N.J., N.Y., Ohio, Pa., Tex. (1)
X. vesicatoria (Doidge) Dowson var. raphani (H.E.White) Starr. & Burk., bacterial spot. Ind.

Curly top -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.). Calif. (1)
Mosaic -- unidentified virus. Calif., Ind., Hawaii. Both Marmor brassicae Holmes and M. cruciferarum Holmes (Brassica viruses 2 and 3 K.M.Sm.) can induce systemic mottling in this host.

RORIPPA (CRUCIFERAE)

RORIPPA ISLANDICA (Murray) Borbas Bess., including var. HISPIDA (Desv.) Butters & Abbe, MARSH CRESS (1). Annual or biennial herb of bogs, naturalized from Europe or native throughout the U.S. R. SYLVESTRIS (L.) Bess., YELLOW FIELD CRESS (2). Perennial of wet meadows, naturalized from Europe in the Eastern States. Both spp. of food value to wildlife.

Albugo candida (Pers. ex Chev.) O.Kuntze, white blister. Ill., N.&S.Dak., Oreg., Wis. (1)
Cercospora cruciferarum Ell. & Ev., leaf spot. Ind. (1)
C. nasturtii Pass., leaf spot. Wis. (1,2) Canada.
Heterodera marioni (Cornu) Goodey, root knot. ? Fla. (1)
Peronospora lepidii (McAlp.) G.W.Wils., downy mildew. Iowa (1)
P. parasitica Pers. ex Fr., downy mildew. Iowa, Mich., Wis. (1)
Plasmodiophora brassicae Wor., club root. N.J. (1,2)
Puccinia aristidae Tracy (O,I), rust. Colo. (1)
Septoria radiculae Dearn., leaf spot. N.Y. (1)

SISYMBRIUM (CRUCIFERAE)

SISYMBRIUM ALTISSIMUM L., HEDGE-MUSTARD (1), S. OFFICINALE (L.) Scop., TALL H.-M. (2), S. IRIO (L.) Britt. (3). Coarse annuals or biennials of Europe; (1) and (2) established as weeds throughout the U.S., especially in the Middle and Far West; (1) is of food value to wildlife, (3) is a potential green-manure crop.

Albugo candida (Pers. ex Chev.) O.Kuntze, white blister. General (1,2); Tex. (3)
Cercospora sp., leaf spot. Del. (2). Reported as both C. cruci-

Sisymbrium cont.
ferarum Ell. & Ev. and C. nasturtii Pass.
Peronospora parasitica Pers. ex Fr. (P. sisymbrii-officinalis Gäum.), downy mildew. Wis. (1), Iowa (2), Kans.
Plasmodiophora brassicae Wor., club root. N.J. (1,2); Wash. (2)
Puccinia aristidae Tracy (O,I), rust. Colo. (1)
Septoria sisymbrii Ell., leaf spot. Ida., Ky., Mich., N.J., W.Va. (2)
? Typhula sp. (Sclerotium fulvum Fr.), on stems. Mont. (1)

SMELOWSKIA (CRUCIFERAE)

SMELOWSKIA spp. Low perennial herbs of alpine areas in the Western States, sometimes grown in rock gardens.

Puccinia aberrans Pk. (C, III), rust. Colo., Mont., Nev., Utah, Wash.
P. holboellii (Hornem.) Rostr. (C,III), rust. Nev.
P. monoica (Pk.) Arth. (O,I), rust. Colo., Wyo.

STANLEYA (CRUCIFERAE)

STANLEYA PINNATA (Pursh) Britt., DESERTPLUME. Coarse showy-flowered perennial of arid plains, sometimes grown for ornament.

Cercospora nasturtii Pass., leaf spot. Kans.
Puccinia aristidae Tracy (O,I), rust. Colo., Nev.

THLASPI (CRUCIFERAE)

THLASPI ARVENSE L., PENNY-CRESS, FRENCHWEED (1). Annual naturalized from Europe, a troublesome weed in the northern U.S. but is of food value to wildlife. Several Thlaspi spp., both native and introduced are sometimes grown in gardens for the ornamental pods.

Albugo candida (Pers. ex Chev.) O.Kuntze, white blister. Colo., Mont., Wyo.
Plasmodiophora brassicae Wor., club root. N.J. (1)
Puccinia aristidae Tracy (O,I), rust. Colo. (1)
P. oudemansii Tranz. (III), rust. Utah
P. thlaspeos Schub. (III), rust. Colo., Ida., Utah, Wyo.
Sclerotinia sclerotiorum (Lib.) DBy., crown rot. Mont. (1)

This issue completes the Cruciferae. The next family to be taken up will be the Cucurbitaceae.

DIVISION OF MYCOLOGY AND DISEASE SURVEY

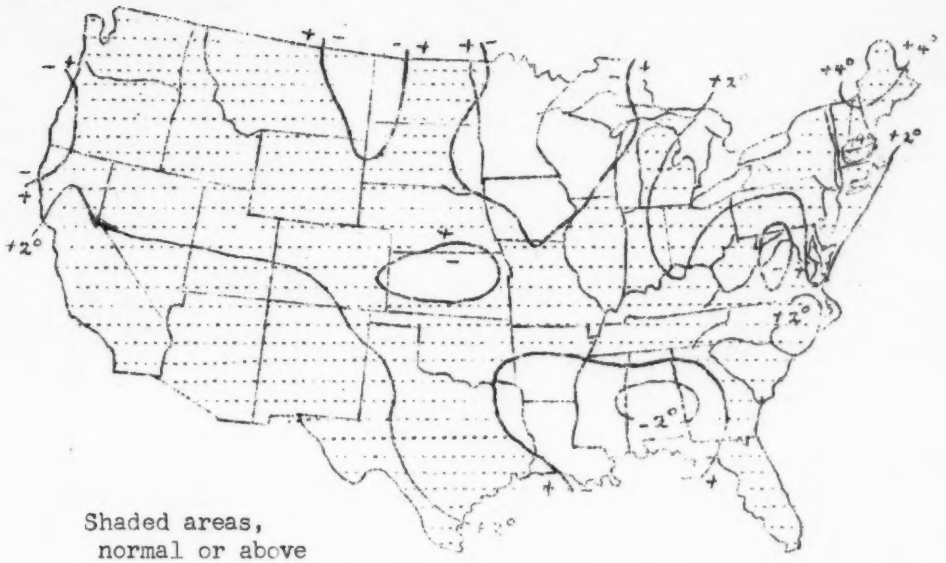
## SEPTEMBER WEATHER

(From U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for week ending October 8, 1946.)

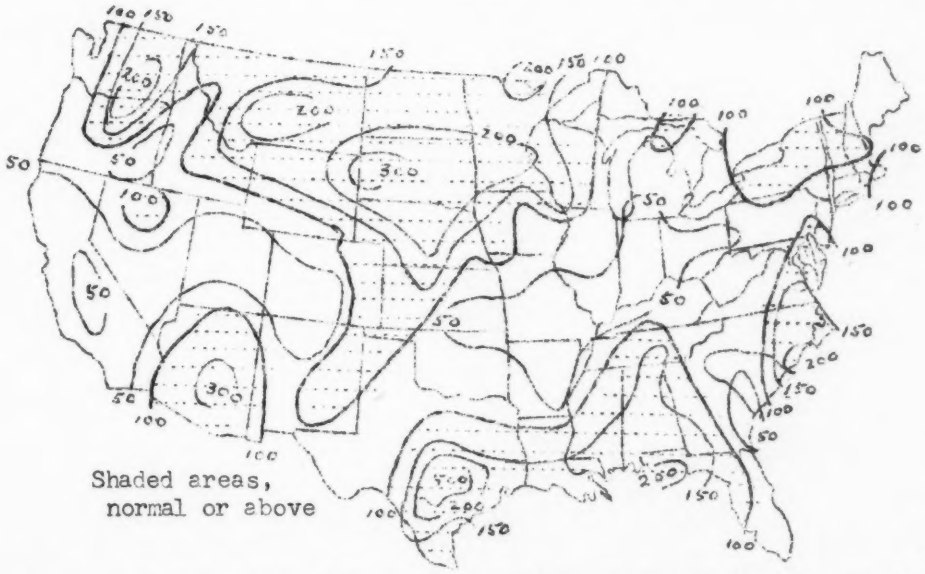
Map I shows that the month of September 1946 averaged a few degrees warmer than usual in the Northeast and far Southwest, including California, while departures ranged from 1° to about 3° below normal in the east-central Gulf area; elsewhere temperatures generally averaged near normal.

Map II presents the areal distribution of total precipitation during September 1946. The amounts were heavy from the northern and eastern Rocky Mountain areas eastward to the western Lake region, in the Gulf coastal Plains, middle Atlantic coastal sections, and in New York, Alabama, east-central Tennessee, and Arizona.

The accumulations were more than twice their normals in sections of the north-central Plains, Montana, south-central Arizona, southeast Texas, and in a few areas elsewhere. Less than half the usual amount was received in the area from Arkansas and extreme northeastern Oklahoma northeastward over the lower Ohio Valley and southern Lake region, and in most areas from eastern Colorado westward to the California coast.




Map I. Departure of Mean Temperature from the Normal, September, 1946




Map II. Percentage of Normal Precipitation for September, 1946